

REMARKS

Claims 1-25 are all the claims pending in the application. Claims 10, 11, 18 and 19 have been amended to be in independent form. Support for the amendments to claims 10, 11, 18, and 19 may be found in the specification as originally filed, for example, in the original claims and at page 52, lines 14-26. Support for new claims 22-25 may be found in the specification as originally filed, for example, in original claims 1, 3, 10 and 11.

I. The Rejections For Formalities

Claims 2, 5, 20, 11, 18 and 19 are rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite.

Additionally, claims 1, 3, 13, 14, and 21 (the independent claims) are alleged to contain "miscellaneous" informalities.

Applicants' claims have been amended to clarify the language and to more particularly point out and distinctly claim Applicants' invention. In particular, Applicants' claims have been amended to more positively recite the claim embodiments and to provide clear antecedent basis for the terms recited therein.

For the above reasons, it is respectfully submitted that Applicants' claims are clear and definite and it is requested that the rejection under 35 U.S.C. §112 and the "miscellaneous" objections to the claims be reconsidered and withdrawn.

II. The Rejections Under 35 U.S.C. §§102 and 103

Claim 1 is rejected under 35 U.S.C. §102(b) as allegedly anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP11-740079 (JP '079), JP11-185961 (JP '961) or JP11-2974473 (JP '473).

Claims 1-4, 6, 10-16 and 18-21 are rejected under 35 U.S.C. §102(b) as allegedly being unpatentable over JP9-268284 (JP '284).

Claims 5, 7-11 and 17-19 are rejected under 35 U.S.C. §103 as allegedly being unpatentable over JP '284.

Applicants respectfully submit that the present invention is not anticipated by or obvious over JP '079, JP '961, JP '473 or JP '284 and request that the Examiner reconsider and withdraw this rejection in view of the following remarks.

Applicants' invention relates to compounds of structural formula [2.1], which contain at least one group represented by structural formula [2.2] and which further comprise at least one saturated hydrocarbon group having two or more hydrocarbon groups in which oxygen atom(s) may be inserted. The hydrocarbon groups in which oxygen atoms may be inserted causes a steric hindrance, and concentration quenching is unexpectedly suppressed. (See, for example, Applicants' specification, page 9, line 25-page 15, line 16).

Applicants' invention also relates to compounds of structural formula [3.1], which contain at least one group represented by structural formula [3.2] and where R₆ is a substituent other than a hydrogen atom. This structure unexpectedly

results in chemical stability. (See, for example, Applicants' specification, page 15, line 22-page 17, line 16).

Claims 1 and 2 (structural formulae [1.1] and [1.2] are generic to both inventive concepts.

Applicants respectfully submit that these two characteristics, as explained above, are not taught in or disclosed by the cited references. Further, the cited references do not teach or disclose the advantages derived from these two characteristics and Applicants' claimed invention.

As to the rejection of claim 4 based on JP '284, the Examiner particularly cites compounds (12), (13) and (17) of JP '284. Compounds (12) and (17) contain substituent groups containing nitrogen atoms. Applicants respectfully traverse the Examiner's position based on compounds (12) and (17) based on the nitrogen containing substituent groups not being hydrocarbon groups. Further, the substituents of compound (17) do not appear to be saturated. As to compound (13) of JP '284, Applicants' claim 5 further distinguishes Applicants' invention due to the position of the saturated hydrocarbon group(s) having two or more carbon atoms. This position improves steric hindrance. See Applicants' specification, page 11, lines 11-16.

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Compound (39) of JP '284 has a single methoxy group. In Applicants' invention, preferably a bulky substituent provides for the steric hindrance. See Applicants' specification, page 10, lines 17-26.

For the above reasons, it is respectfully submitted that the subject matter of claims 1-25 is neither taught by nor made obvious from the disclosures of JP '079, JP '961, JP '473 or JP '284 and it is requested that the rejections under 35 U.S.C. §§102 and 103 be reconsidered and withdrawn.

III. Conclusion

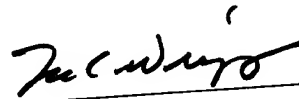
In view of the above, Applicants respectfully submit that their claimed invention is allowable and ask that the rejection under 35 U.S.C. §112 and the rejections under 35 U.S.C. §§102 and 103 be reconsidered and withdrawn. Applicants respectfully submit that this case is in condition for allowance and allowance is respectfully solicited.

If any points remain at issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the local exchange number listed below.

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Applicants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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Date: April 30, 2002

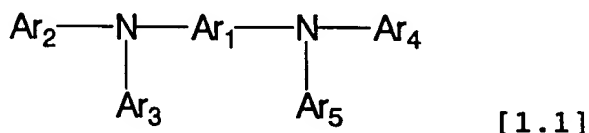
APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

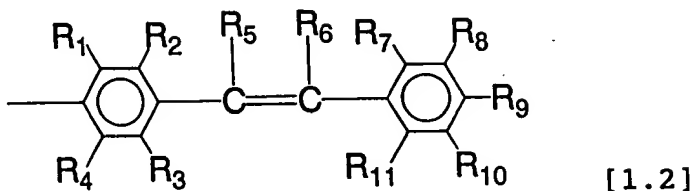
1 (twice amended). An organic electroluminescent device comprising one or more organic thin film layer(s) placed between an anode and a cathode,

wherein at least one of said one or more organic thin film layer(s) {layer being} is a luminescent layer, {characterized in that} said luminescent layer {comprises} comprising a compound represented by {expressed in} the following general formula [1.1] {in the form of a single substance or a mixture containing the same.};



{(}wherein{)} Ar₁ represents a substituted or unsubstituted arylene group having 5 to 42 carbon atoms; at least one of Ar₂ to Ar₅ independently represents a group represented by {expressed in} the following general formula [1.2]; the remaining group(s) of Ar₂ to Ar₅ independently represents an aryl group having 6 to 20 carbon atoms; and at least one of Ar₂ to Ar₅ comprises at least one hydrocarbon group which

may include oxygen atom(s){.}; and Ar₂ and Ar₃ and/or Ar₄ and Ar₅ may mutually bond to form a ring{.});



{(}wherein{(} each of R₁ to R₁₁ independently represents a hydrogen atom, halogen atom, {hydroxyl} hydroxy group, substituted or unsubstituted amino group, cyano group, nitro group, substituted or unsubstituted alkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted aromatic hydrocarbon group, substituted or unsubstituted aromatic heterocyclic group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryloxy group, substituted or unsubstituted alkoxycarbonyl group, or carboxyl group{(Two}); and two of R₁ to R₁₁ may form a ring.{)}

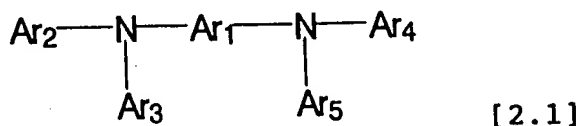
2 (amended). The organic electroluminescent device according to Claim 1 wherein R₆ is said hydrocarbon group which may include oxygen atom(s).

3 (twice amended). An organic electroluminescent device comprising one or more organic thin film layer(s) placed between an anode and a cathode, at least one

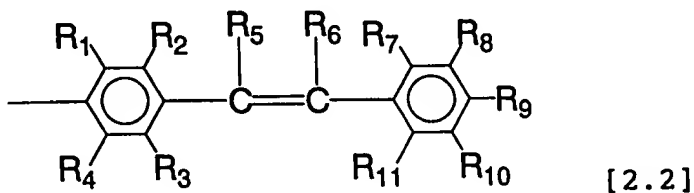
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of said organic thin film {layer} layer(s) being a luminescent layer,

wherein {characterized in that} said luminescent layer comprises a compound represented by {expressed in} the following general formula [2.1]; {in the form of a single substance or a mixture containing the same.}



{wherein{}} Ar₁ represents a substituted or unsubstituted arylene group having 5 to 42 carbon atoms; at least one of Ar₂ to Ar₅ independently represents a group represented by {expressed in} the following general formula [2.2]; the remaining group(s) of Ar₂ to Ar₅ independently represents an aryl group having 6 to 20 carbon atoms; and at least one of Ar₂ to Ar₅ comprises at least one saturated hydrocarbon group having 2 or more carbon atoms in which oxygen atom(s) may be inserted{.}; and Ar₂ and Ar₃ and/or Ar₄ and Ar₅ may mutually bond to form a ring{.});



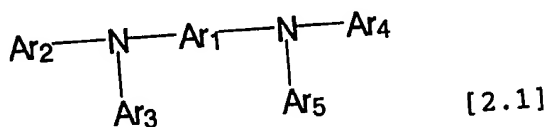
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{()wherein, each of R₁ to R₁₁ independently represents a hydrogen atom, halogen atom, {hydroxyl} hydroxy group, substituted or unsubstituted amino group, cyano group, nitro group, substituted or unsubstituted alkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted aromatic hydrocarbon group, substituted or unsubstituted aromatic heterocyclic group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryloxy group, substituted or unsubstituted alkoxycarbonyl group, or carboxyl group{. Two}; and two of R₁ to R₁₁ may form a ring.()}

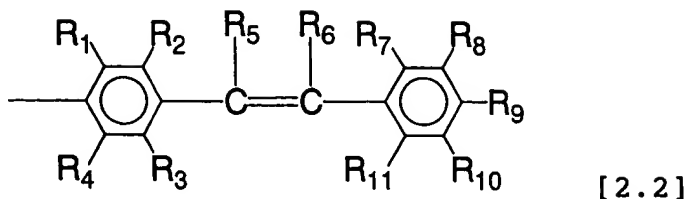
4 (amended). The organic electroluminescent device according to Claim 3 wherein said saturated hydrocarbon group having 2 or more carbon atoms in which oxygen atom(s) may be inserted is a group bonded to an aryl group other than {a} an aryl group {expressed} in {the} general formula [2.2].

5 (amended). The organic electroluminescent device according to Claim 4 wherein at least one of said saturated hydrocarbon group(s) having two or more carbon atoms in which oxygen atom(s) may be inserted is bonded to {at least one of} a carbon atom of said aryl group other than an aryl group in general formula [2.2] at a position ortho to {directly bonded to} a carbon atom bonded to a nitrogen atom of said general formula [2.1] {, in said aryl group}.

10 (amended). {The} An organic electroluminescent {device according to Claim 3 wherein the device has at least a hole transporting layer, and the hole transporting layer contains a compound expressed in the general formula [2.1] in the form of a single substance or a mixture containing the same} element comprising one or more organic thin film layer(s) placed between an anode and a cathode, at least one of the organic thin film layer(s) being a hole transporting layer, wherein said luminescent layer comprises a compound represented by the following general formula [2.1]:



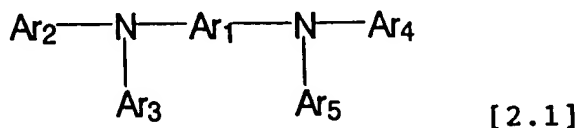
wherein Ar₁ represents a substituted or unsubstituted arylene group having 5 to 42 carbon atoms; at least one of Ar₂ to Ar₅ independently represents a group represented by the following general formula [2.2]; the remaining group(s) of Ar₂ to Ar₅ independently represents an aryl group having 6 to 20 carbon atoms; and at least one of Ar₂ to Ar₅ comprises at least one saturated hydrocarbon group having 2 or more carbon atoms in which oxygen atom(s) may be inserted; and Ar₂ and Ar₃ and/or Ar₄ and Ar₅ may mutually bond to form a ring:



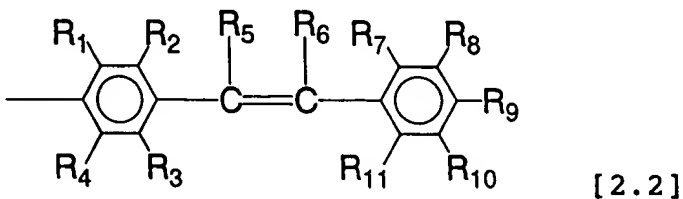
wherein, each of R₁ to R₁₁ independently represents a hydrogen atom, halogen atom, hydroxy group, substituted or unsubstituted amino group, cyano group, nitro group, substituted or unsubstituted alkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted aromatic hydrocarbon group, substituted or unsubstituted aromatic heterocyclic group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryloxy group, substituted or unsubstituted alkoxycarbonyl group, or carboxyl group; and two of R₁ to R₁₁ may form a ring.

11 (amended). {The} An organic electroluminescent {device according to Claim 3 wherein the device has at least an electron transporting layer, and the electron transporting layer contains a compound expressed in the general formula [2.1] in the form of a single substance or a mixture containing the same} element comprising one or more organic thin film layer(s) placed between an anode and a cathode, at least one of the organic thin film layer(s) being an electron transporting layer.

wherein said electron transporting layer comprises a compound represented by the following general formula [2.1]:



wherein Ar₁ represents a substituted or unsubstituted arylene group having 5 to 42 carbon atoms; at least one of Ar₂ to Ar₅ independently represents a group represented by the following general formula [2.2]; the remaining group(s) of Ar₂ to Ar₅ independently represents an aryl group having 6 to 20 carbon atoms; and at least one of Ar₂ to Ar₅ comprises at least one saturated hydrocarbon group having 2 or more carbon atoms in which oxygen atom(s) may be inserted; and Ar₂ and Ar₃ and/or Ar₄ and Ar₅ may mutually bond to form a ring:



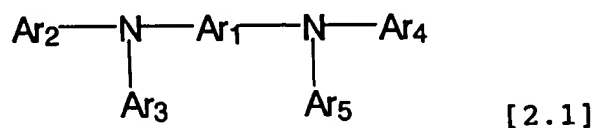
wherein, each of R₁ to R₁₁ independently represents a hydrogen atom, halogen atom,

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hydroxy group, substituted or unsubstituted amino group, cyano group, nitro group, substituted or unsubstituted alkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted aromatic hydrocarbon group, substituted or unsubstituted aromatic heterocyclic group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryloxy group, substituted or unsubstituted alkoxycarbonyl group, or carboxyl group; and two of R₁ to R₁₁ may form a ring.

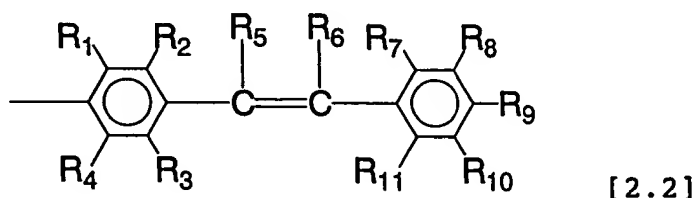
13 (twice amended). An organic electroluminescent device comprising at least an anode, a luminescent zone and a cathode, the luminescent zone being formed from one or more organic thin film layer(s),

{characterized in that} wherein said luminescent zone is adjacent to the anode, and {a layer adjacent to the anode of the} an organic thin film {layer(s) forming} layer of the luminescent zone which is adjacent to the anode contains a compound represented by {expressed in} the following general formula [2.1]: {in the form of a single substance or a mixture containing the same.}



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{(}wherein, Ar₁ represents a substituted or unsubstituted arylene group having 5 to 42 carbon atoms; at least one of Ar₂ to Ar₅ independently represents a group represented by {expressed in} the following general formula [2.2]; the remaining group(s) of Ar₂ to Ar₅ independently represents an aryl group having 6 to 20 carbon atoms; and at least one of Ar₂ to Ar₅ comprises at least one saturated hydrocarbon group having 2 or more carbon atoms in which oxygen atom(s) may be inserted{.}; and Ar₂ and Ar₃ and/or Ar₄ and Ar₅ may mutually bond to form a ring{.});

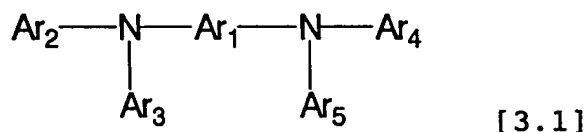


{(}wherein{,} each of R₁ to R₁₁ independently represents a hydrogen atom, halogen atom, {hydroxyl} hydroxy group, substituted or unsubstituted amino group, cyano group, nitro group, substituted or unsubstituted alkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted aromatic hydrocarbon group, substituted or unsubstituted aromatic heterocyclic group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryloxy group, substituted or unsubstituted alkoxycarbonyl group, or carboxyl group{. Two}

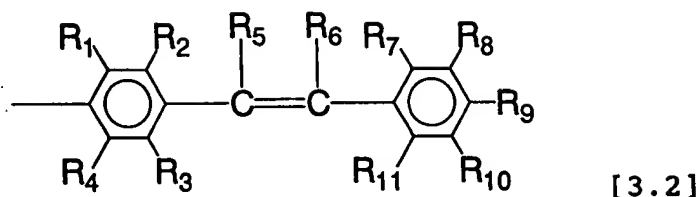
and two of R₁ to R₁₁ may form a ring.{} }

14 (twice amended). An organic electroluminescent device comprising one or more organic thin film layer(s) placed between an anode and a cathode, at least one of said layer being a luminescent layer,

{characterized in that} wherein said luminescent layer comprises a compound represented by {expressed in} the following general formula [3.1]; {in the form of a single substance or a mixture containing the same.}



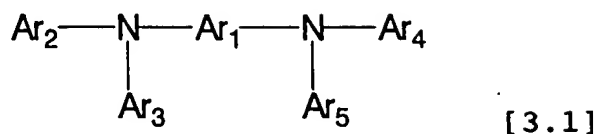
{(}wherein{)} Ar₁ represents a substituted or unsubstituted arylene group having 5 to 42 carbon atoms; each of Ar₂ and Ar₃ independently represents a group {expressed in} represented by the following general formula [3.2]; and each of Ar₄ and Ar₅ independently represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms{.}; and Ar₂ and Ar₃ and/or Ar₄ and Ar₅ may mutually bond to form a ring{.});



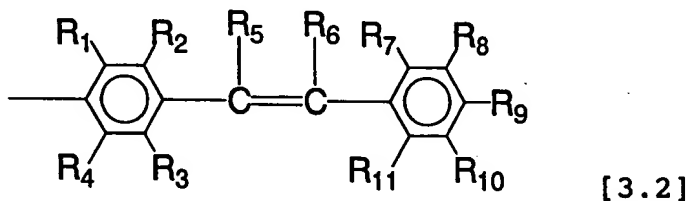
{(}wherein{,} each of R₁ to R₁₁ independently represents a hydrogen atom, halogen atom, {hydroxyl} hydroxy group, substituted or unsubstituted amino group, cyano group, nitro group, substituted or unsubstituted alkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted aromatic hydrocarbon group, substituted or unsubstituted aromatic heterocyclic group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryloxy group, substituted or unsubstituted alkoxycarbonyl group, or carboxyl group; and R₆ is a substituent other than a hydrogen atom{. Two}; and two of R₁ to R₁₁ may form a ring.{} }

18 (amended). {The} An organic electroluminescent {device according to Claim 14 wherein the device has at least a hole transporting layer, and the hole transporting layer contains a compound expressed in the general formula [3.1] in the form of a single substance or a mixture containing the same} element comprising one or more organic thin film layer(s) placed between an anode and a cathode, at least one of the organic thin film layer(s) being a hole transporting layer, wherein said hole transporting layer comprises a compound represented by

the following general formula [3.1]:



wherein Ar₁ represents a substituted or unsubstituted arylene group having 5 to 42 carbon atoms; each of Ar₂ and Ar₃ independently represents a group represented by the following general formula [3.2]; and each of Ar₄ and Ar₅ independently represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms; and Ar₂ and Ar₃ and/or Ar₄ and Ar₅ may mutually bond to form a ring:



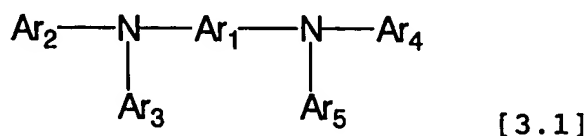
wherein each of R₁ to R₁₁ independently represents a hydrogen atom, halogen atom, hydroxy group, substituted or unsubstituted amino group, cyano group, nitro group, substituted or unsubstituted alkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted

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alkoxy group, substituted or unsubstituted aromatic hydrocarbon group, substituted or unsubstituted aromatic heterocyclic group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryloxy group, substituted or unsubstituted alkoxycarbonyl group, or carboxyl group; and R₆ is a substituent other than a hydrogen atom; and two of R₁ to R₁₁ may form a ring.

19 (amended). {The} An organic electroluminescent {device according to Claim 14 wherein the device has at least an electron transporting layer, and the electron transporting layer contains a compound expressed in the general formula [3.1] in the form of a single substance or a mixture containing the same} element comprising one or more organic thin film layer(s) placed between an anode and a cathode, at least one of the organic thin film layer(s) being an electron transporting layer.

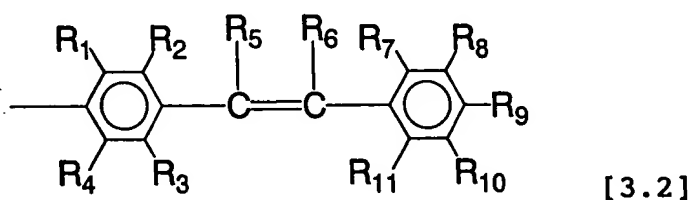
wherein said electron transporting layer comprises a compound represented by the following general formula [3.1]:



wherein Ar₁ represents a substituted or unsubstituted arylene group having 5 to 42

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carbon atoms; each of Ar₂ and Ar₃ independently represents a group represented by the following general formula [3.2]; and each of Ar₄ and Ar₅ independently represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms; and Ar₂ and Ar₃ and/or Ar₄ and Ar₅ may mutually bond to form a ring:

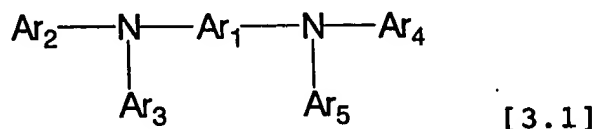


wherein each of R₁ to R₁₁ independently represents a hydrogen atom, halogen atom, hydroxy group, substituted or unsubstituted amino group, cyano group, nitro group, substituted or unsubstituted alkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted aromatic hydrocarbon group, substituted or unsubstituted aromatic heterocyclic group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryloxy group, substituted or unsubstituted alkoxycarbonyl group, or carboxyl group; and R₆ is a substituent other than a hydrogen atom; and two of R₁ to R₁₁ may form a ring.

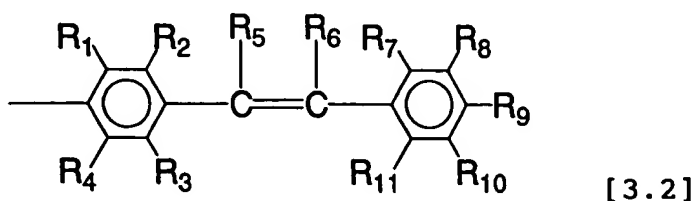
21 (twice amended). An organic electroluminescent device comprising at least an anode, a luminescent zone and a cathode, the luminescent zone being

formed from one or more organic thin film layer(s),

{characterized in that} wherein said luminescent zone is adjacent to the anode, and {a layer adjacent to the anode of the} an organic thin film {layer(s) forming} layer of the luminescent zone which is adjacent to the anode contains a compound represented by {expressed in} the following general formula [3.1] in the form of a single substance or a mixture containing the same{.};



{(}wherein{.)} Ar₁ represents a substituted or unsubstituted arylene group having 5 to 42 carbon atoms; each of Ar₂ and Ar₃ independently represents a group represented by {expressed in} the following general formula [3.2]; and each of Ar₄ and Ar₅ independently represents substituted or unsubstituted aryl group having 6 to 20 carbon atoms{.}; and Ar₂ and Ar₃ and/or Ar₄ and Ar₅ may mutually bond to form a ring{.});



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{(wherein{,} each of R₁ to R₁₁ independently represents a hydrogen atom, halogen atom, {hydroxyl} hydroxy group, substituted or unsubstituted amino group, cyano group, nitro group, substituted or unsubstituted alkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted aromatic hydrocarbon group, substituted or unsubstituted aromatic heterocyclic group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryloxy group, substituted or unsubstituted alkoxycarbonyl group, or carboxyl group; and R₆ is a substituent other than a hydrogen atom{. Two}; and two of R₁ to R₁₁ may form a ring.{} }

Claims 22-25 are added as new claims.